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10/553,965	10/19/2005	Jean-Paul Petillon	0595-1050	9960

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EXAMINER	
ARTHUR JEANGLAUDE, GERTRUDE	
ART UNIT	**PAPER NUMBER**
3661	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,965	PETILLON, JEAN-PAUL	
	Examiner	Art Unit	
	Gertrude Arthur-Jeanglaude	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-31 and 37-42* is/are rejected.

7)☒ Claim(s) *32-36 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/19/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 25 is objected to because of the following informalities: at line 2 the phrase "an the" before the word aircraft needs to be corrected. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 23-31, 37-42, are rejected under 35 U.S.C. 103(a) as being unpatentable over Baiada et al. (U.S. 6,721,714) in view of D'orso (U.S 5,555,175).

Pratt et al. (U.S. Patent No. 6,421,603) in view of Bergljung et al. (U.S. Patent No. 6,114,990).

As to claim 23, Baiada et al. disclose a method of providing assistance in navigating an aircraft (through navigation system; see col. 6, lines 26-30) along an itinerary defined by itinerary data (ITI) (col. 4, lines 28-41), the method including calculating, on board the aircraft, a predicted trajectory (TDC) for the aircraft, as a function of itinerary data (ITI) and characteristics of the aircraft (See abstract), the

predicted trajectory being continuous and three dimensional (See col. 3, lines 65-col. 4, line 23), Baiada et al. discloses the time for the predicted trajectory wherein it would also be obvious to have the date (See col. 3, lines 18-27); Baiada et al. does not specifically disclose including curvilinear portions, having no angle point, and complying with the flight envelope of the aircraft. In an analogous art, D'orso discloses a method for assisting the piloting of an aircraft with predicted trajectory with curvilinear portions, having no angle point, and complying with the flight envelope of the aircraft (See abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Baiada et al. with that of D'orso by having a predicted trajectory with curvilinear portions, having no angle point and complying with the flight envelope of the aircraft in order to provide directional guidance for the aircraft.

As to claim 24, Baiada et al. disclose simulation is used to calculate at least a portion of the predicted trajectory in discrete manner, from an initial state vector (VEI) of the aircraft (See abstract; col. 2, lines 40-65).

As to claim 25, Baiada et al. disclose simulation includes simulating an the aircraft autopilot by an autopilot simulation (SPA) module, simulating the aircraft by an aircraft simulation (ATS) module, and simulating the aircraft guidance by a guidance simulation (SGU) module (See col. 6, lines 26-30).

As to claim 26,Baoada et al. disclose the capability in which at least a portion of the predicted trajectory is calculated analytically, by solving a system of differential equations (See col.3, line 65-col. 4, line23).

As to claim 27, Baiada et al. disclose all but fail to specifically disclose a curvilinear portion of the trajectory is calculated on the basis of a rate of variation in heading or in altitude that is less than the rate corresponding to the autopilot limitations. In an analogous art, D'orso discloses a method for assisting the piloting of an aircraft with predicted trajectory with curvilinear portions, having no angle point, and complying with the flight envelope of the aircraft (See abstract) (wherein one would consider that the trajectory is calculated on the basis of a rate of variation in heading or in altitude that is less than the rate corresponding to the autopilot limitations). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Baiada et al. with that of D'orso by calculating a predicted trajectory on the basis of a rate of variation in heading or in altitude that is less than the rate corresponding to the autopilot limitations in order to provide directional guidance for the aircraft.

As to claim 28, Baiada et al. disclose the predicted trajectory (TDC) is calculated as a function of characteristics of the aircraft and of the outside environment; the characteristics being acquired using means on board the aircraft (99) and including at least: a geographical position for the aircraft (99); angles defining attitude and heading of the aircraft (99); a ground speed vector for the aircraft (99); an air speed vector; static temperature and pressure of the air surrounding the aircraft (99); and current state of the weight and of the engine(s) of the aircraft (99) (See col. 4, lines 28-41).

As to claim 29, . Baiada et al. disclose input of data (collected specified data) modifying the itinerary and/or the trajectory is monitored, and in the event of an operator

inputting data to modify the itinerary and/or the trajectory, the calculation of the trajectory is reiterated (See abstract).

As to claim 30, Baiada et al. disclose all or part of a state vector of the aircraft is monitored and/or measured, including a 3D position component, a 3D speed component, aircraft weight, and/or a state for each engine, and in the event of a substantial change in the state vector being detected, the trajectory calculation is reiterated (See col. 2, lines 40-65; col. 3, lines 40-63).

As to claim 31, Baiada et al. disclose a state vector of the atmosphere is monitored and/or measured, including wind speed, and/or air density or temperature, and whenever a substantial change in the state vector of the atmosphere is detected, calculation of the trajectory is reiterated (See col. 4, lines 28-41).

As to claims 37-42, Baiada et al. disclose all including on board or mountable on board a rotary-wing aircraft (99) so as to facilitate navigating, guiding, and piloting, the apparatus (1) comprising a system (2) programmed to calculate a three-dimensional continuous predicted aircraft trajectory (TDC) that is close to an itinerary (See col. 6, lines 26-30), but does not specifically disclose obtaining an updated setpoint trajectory for the pilot and/or the autopilot; is verified that the distance between the predicted trajectory and the current position of the aircraft remains below a predetermined value, and if not, an audible alarm is triggered and/or a warning sign is displayed; and wherein the setpoint predicted trajectory includes a re-joining trajectory calculated to connect the current position of the aircraft to the itinerary; and in which the setpoint trajectory includes at least one takeoff trajectory and at least one landing trajectory; and wherein

the apparatus including a tool for inputting itinerary data, a module for monitoring data input by the tool, and for causing the trajectory calculation to be reiterated when itinerary data is modified, and a member (6) for displaying the calculated trajectory . In an analogous art, D'orso discloses a pilot input and distance indication; and also discloses that directional guidance is performed by superimposition of the speed vector and of the piloting curve; it discloses defined reference points wherein one of ordinary skill in the art would updated setpoint trajectory for the pilot and/or the autopilot for take off and landing (See col. 2, lines 31-62); D'orso also disclose an audible alarm is triggered and/or a warning sign is displayed (See col. 4, lines 20-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Baiada et al. with that of D'orso by having an updated setpoint trajectory for the pilot and/or the autopilot; is verified that the distance between the predicted trajectory and the current position of the aircraft remains below a predetermined value, and if not, an audible alarm is triggered and/or a warning sign is displayed; and wherein the setpoint predicted trajectory includes a re-joining trajectory calculated to connect the current position of the aircraft to the itinerary; and in which the setpoint trajectory includes at least one takeoff trajectory and at least one landing trajectory; and wherein the apparatus including a tool for inputting itinerary data, a module for monitoring data input by the tool, and for causing the trajectory calculation to be reiterated when itinerary data is modified, and a member (6) for displaying the calculated trajectory since it relates to assisting with the piloting of an aircraft.

Allowable Subject Matter

Claims 32-36, 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to disclose the following steps: i) recording in at least one on-board memory predicted capabilities or characteristics for the aircraft, together with a terrain and obstacle model; and then with the help of an on-board computer: ii) calculating the predicted trajectory to be close to the itinerary and to correspond to the predicted capabilities or characteristics of the aircraft; iii) determining a tube or tunnel extending along the trajectory and of section that corresponds to safety margins; iv) looking to see whether a point of the terrain and obstacle model is included inside the tube or tunnel, and if so determining at least one trajectory portion that interferes with the terrain and obstacle model; and then v) where appropriate, presenting to an on-board operator said trajectory and/or the trajectory portion that interferes, and doing so at a presentation frequency.

Nor does the prior art disclose any interference between a safety volume extending along the setpoint trajectory and a terrain and obstacle model is determined, and any interference is presented to an on-board operator in a manner that is repeated in time and at a presentation frequency that is high enough to enable the itinerary to be modified so as to cause said interference to disappear.

Nor does the prior art disclose the apparatus comprising: acquisition means for acquiring parameters relating to the aircraft and to the outside environment, which

acquisition means include means for accurately determining the position of the aircraft in three dimensions; a modifiable memory or database for storing the itinerary; a memory or database containing data concerning the height of terrain and obstacles to be overflown; display means for displaying a chart to an on-board operator; an interactive graphics tool for constructing the itinerary; trajectory calculation means for calculating an essentially curvilinear trajectory in three dimensions that is close to the itinerary and that corresponds to the predicted capabilities of the aircraft, and preferably doing so at a calculation frequency that is not less than the presentation frequency; detector means for detecting any interference between a safety volume extending along the calculated trajectory and terrain overflown by the aircraft; a guidance calculator having inputs connected to the trajectory calculation means and to the sensors, and having outputs connected both to a pilot data display device and to an autopilot system; and visual presentation means for presenting any interference to an on-board operator in a manner that is repeated in time at a presentation frequency that is high enough to enable the operator to modify the itinerary using the interactive tool so as to cause the interference to disappear.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gertrude Arthur-Jeanglaude whose telephone number is (571) 272-6954. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gertrude A. Jeanglaude
Primary Examiner
Au 3661

gaj